

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing of claims in the application.

1. (currently amended) A diode [array end] pumped multiple mode slab laser comprising:

a laser diode [having at least one diode bar] for providing diode laser pump light in a vertical and horizontal direction to [the] an optical axis, and over a wide range of temperatures, said diode laser pump light having a pump light wavelength, said laser diode being installed in said laser without a temperature control system so that said pump light wavelength varies according to temperature;

a first cylindrical lens for collimating said diode laser pump light in said vertical direction on said optical axis [after said laser diode bar];

a second cylindrical lens on said optical axis perpendicular to and after said first cylindrical lens for collecting said diode laser pump light [output] from said first cylindrical lens [and] for further focusing [onto] into a laser cavity [as focused laser pump light];

said laser cavity on said optical axis after said second cylindrical lens, and comprising a laser slab of solid state crystal with a length and polished input and output ends, and further having a rectangular cross-section with rough ground top and bottom surfaces and polished side surfaces, [the] said laser slab accepting as input said [focused] diode laser pump light at said polished input end with unabsorbed diode laser pump light being reflected within the laser slab off [the] said polished side surfaces [and outputting from said polished output end absorbed laser energy, whereby laser pump light remains collimated in said vertical direction throughout said laser slab and said pump light further includes laser mode overlap] for [focused laser] efficient pump light absorption along all of said laser slab length and multiple mode lasing as said pump light wavelength varies according to temperature, said polished output end outputting absorbed laser energy.

2. (currently amended) The diode [array end] pumped multiple mode slab laser of claim 1 wherein said laser cavity further includes a Q-switch having input and output ends on the optical axis, with dichroic coatings at said input and output ends, said Q-switch for producing peak power pulses.

3. (currently amended) The diode [array end] pumped multiple mode slab laser of claim 1 wherein said laser cavity further includes a non-linear crystal to produce additional wavelengths.

4. (currently amended) The diode [array end] pumped multiple mode slab laser of claim 1 wherein there is further included a non-linear crystal after said laser cavity on the optical axis [for] to produce additional wavelengths.

5. (currently amended) A [diode array end pumped multiple mode slab] lasing technique for generating a laser beam over a wide range of temperatures using diode pump light, said technique comprising the steps of:

providing a laser diode without a temperature control system;

generating said diode laser pump light in a vertical and horizontal direction to the optical axis with [a] said laser diode, said diode pump light having a pump light wavelength that varies according to temperature;

collimating said diode laser pump light in said vertical direction with a first cylindrical lens;

[providing a laser slab having a length, an input end, an output end, and a rectangular cross-section with a top surface, a bottom surface and opposing side surfaces;

polishing said [input end, said output end and] said side surfaces;]

receiving said laser pump light from said first cylindrical lens with a second cylindrical lens positioned between said first cylindrical lens and said laser slab; [and,]

affording a laser slab having a length, an input end, an output end, and a rectangular cross-section with a top surface, a bottom surface and opposing side surfaces;

polishing said side surfaces; and,

focusing said laser pump light [onto] into said input end with said second cylindrical lens so that said laser pump light remains collimated perpendicular throughout said laser slab, and further so that said laser pump light reflects off said side surfaces throughout said length of said laser slab to allow for more efficient lasing in multiple modes as said diode pump light wavelength varies according to temperature.

6. (currently amended) A end diode pumped multiple mode slab laser adapted to operate over a wide range of temperatures comprising:

at least one diode bar for providing diode laser pump light in a vertical and horizontal direction to the optical axis, said diode laser pump light having a pump light wavelength, said diode bar being included in said laser without a temperature control system so that said pump light wavelength varies according to temperature;

a first cylindrical lens for collimating said diode laser pump light in said vertical direction on said optical axis after said laser diode bar;

a second cylindrical lens on said optical axis perpendicular to and after said first cylindrical lens for receiving said diode laser pump light from said first cylindrical lens for further direction into a laser slab; [and,]

said laser slab having a length and polished input and output ends, and further having a rectangular cross-section with rough ground top and bottom surfaces and polished side surfaces to establish laser mode overlap and laser pump light absorption along all of said length; and,

said side surfaces reflecting pump light back into said laser slab to allow for more efficient lasing in multiple modes as said pump light wavelength varies according to temperature.